APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/782,199	02/14/2001	Akira Yamaguchi	Q62086	9852

7590   11/12/2003

SUGHRUE, MION, ZINN, MACPEAK & SEAS
2100 Pennsylvania Avenue, N.W.
Washington, DC 20037

EXAMINER
NGUYEN, HOAN C

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 11/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/782,199	YAMAGUCHI, AKIRA
	Examiner	Art Unit
	HOAN C. NGUYEN	2871

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐   Responsive to communication(s) filed on _____ .

2a)☒   This action is **FINAL**.   2b)☐   This action is non-final.

3)☐   Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒   Claim(s) *1-6* is/are pending in the application.

     4a) Of the above claim(s) *7-18* is/are withdrawn from consideration.

5)☐   Claim(s) _____ is/are allowed.

6)☒   Claim(s) *1-6* is/are rejected.

7)☐   Claim(s) _____ is/are objected to.

8)☐   Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐   The specification is objected to by the Examiner.

10)☐   The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐   The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

     If approved, corrected drawings are required in reply to this Office action.

12)☐   The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐   Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☐ All b)☐ Some * c)☐ None of:

         1.☐   Certified copies of the priority documents have been received.

         2.☐   Certified copies of the priority documents have been received in Application No. _____ .

         3.☐   Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

14)☐   Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

     a) ☐ The translation of the foreign language provisional application has been received.

15)☐   Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)	4)☐ Interview Summary (PTO-413) Paper No(s). _____ .
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)	5)☐ Notice of Informal Patent Application (PTO-152)
3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .	6)☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

1.   Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention. Applicant must provide a proof of the formula in

claim 1 based on the boundary condition of Fig. 4.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form

the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public
> use or on sale in this country, more than one year prior to the date of application for patent in the United
> States.

1.   Claims 1-4 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by

Ishihara (US5946100A).

In regard to claims 1-4, Ishihara teaches (Figs. 6-7) a light diffusing plate

comprising:

- a lens substrate;

- a plurality of microlenses disposed on a surface of said lens substrate;

- a plurality of light exit areas (pinhole), each having a circular form a center of which is coincident with an optical axis of each of said plurality of microlenses;
- a light shield layer
  - formed on another surface of the lens substrate reverse to said plurality of microlenses,
  - covering other area than said plurality of light exit areas,

wherein

- when a refractive index of said lens substrate is represented by n; a thickness of said lens substrate by t; a diameter of each of said plurality of light exit areas by R; and a size of each of said plurality of microlenses by Sr, the following formula is satisfied (see attachment for deriving the formula using principle of the geometric optics):

  $$Sr \geq 2t \cdot tan\Theta + R \text{ (with the proviso that } \Theta = sin^{-1}(1/n) \text{ .}$$

- said plurality of microlenses are arranged in a closest packing state or in hexagonal form when viewed from the direction of the optical axis and are arranged in a hexagonal close-packed state (claim 2).
- the light diffusing plate further comprising an anti-reflective layer formed at a light exit side than said light shield layer, and covering other area than said plurality of light exit areas (claim 3).
- microlenses made of glass, therefore the refractive index of said lens substrate is between 1.4 and 2 (claim 4).

In regard to claim 6, Ishihara teaches (Figs. 5-7) a rear projection apparatus comprising

- a rear projection engine for issuing an image-bearing diffused light
- a screen on which the image-bearing diffused light is incident and an image of the image-bearing diffused light is displayed, said screen including a Fresnel lens
- a light diffusing plate,

wherein said light diffusing plate comprises

- a lens substrate;
- a plurality of microlenses disposed on a surface of said lens substrate;
- a plurality of light exit areas, each having a circular form a center of which is coincident with an optical axis of each of said plurality of microlenses;
- a light shield layer formed on another surface of the lens substrate reverse to said plurality of microlenses, and covering other area than said plurality of light exit areas,

wherein when a refractive index of said lens substrate is represented by n; a thickness of said lens substrate by t; a diameter of each of said plurality of light exit areas by R; and a size of each of said plurality of microlenses by Sr, the following formula is satisfied (see attachment for deriving the formula using principle of the geometric optics): $Sr \geq 2t \cdot \tan\Theta + R$ (with the proviso that $\Theta = \sin^{-1}(1/n)$

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2.   Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over

Shinohara et al. (US6231200B1) in view of Ishihara (US5946100A).

Shinohara et al. teach (Fig. 8) a liquid crystal display apparatus comprising:

- a liquid crystal display panel;

- a backlight section for causing a collimated light to be incident on said

  liquid crystal display panel.

However, Shinohara et al. fails to disclose the a light diffusing plate for diffusing

an image-bearing collimated light which has passed through said liquid crystal display

panel, wherein said light diffusing plate comprises features disclosed in claim 1.

Ishihara teaches the a light diffusing plate for diffusing an image-bearing

collimated light which has passed through said liquid crystal display panel, wherein said

light diffusing plate comprises features disclosed in claim 1 for improving array confocal

image system.

Therefore, it would have been obvious to one having ordinary skill in the art at

the time the invention was made to further modify a liquid crystal display apparatus as

Shinohara et al. disclosed with a light diffusing plate for diffusing an image-bearing

collimated light which has passed through said liquid crystal display panel, wherein said

light diffusing plate comprises features disclosed in claim 1 for improving array confocal
image system.

Response to Arguments

Applicant's arguments filed on September 9, 2003 have been fully considered but they
are not persuasive.

Applicant's ONLY arguments are follows:

A.   The direction of the inequality sign of formula in claim 1 is reversed,
therefore Examiner 's logic contradicts the logic the present invention.

B.   claim 2 requires a diffuse reflecting layer that covers "other area than said
plurality of light entrance areas."

Examiner's responses to Applicants' ONLY arguments are follows:

A   In part one, examiner tries to modify Fig. 6 with the boundary/initial
conditions in Fig. 4. The angle $\Theta_{min} = \sin^{-1}(1/n)$ as shown in attachment for which if
angle $\Theta > \Theta_{min}$ light will go through an opening of pin hole and if $\Theta < \Theta_{min}$ light will not go
through an opening of pin hole. Applicant refers Θ_{min} should be Θ_{max} without any
support in specification. If applicant uses different boundary/initial conditions for proof
this formula, applicant should clarify these in specification.

In part two, examiner based on the boundary/initial with the angle $\Theta_{min} =$
$\sin^{-1}(1/n)$ he get

$$Sr- R = 2t \tan\Theta_{min};$$

If angle $\Theta > \Theta_{min}$ so that light will go through an opening of pin hole

$$Sr- R \geq 2t \tan\Theta;$$

therefore,

$$Sr R \geq 2t \tan\Theta + R.$$

If there is another way for proof this formula, please provide the proof.

B   Claim 2 does not cite the feature: "a diffuse reflecting layer that covers

other area than said plurality of light entrance areas." However, claim 3 cites the

feature "anti-reflective layer (not a diffuse reflecting layer) formed at a light exit side than

said light shield layer, and covering other area than said plurality of light exit areas".

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy

as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later
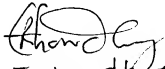
than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HOAN C. NGUYEN whose telephone number is (703) 306-0472. The examiner can normally be reached on MONDAY-THURSDAY:8:00AM-4:30PM.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0530.

HOAN C. NGUYEN
Examiner
Art Unit 2871

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October 14, 2003

T. chowdhuy
Primary Examiner